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**Unpacking the Growth of Medium-scale Farms Zambia: What Are
the Implications for the Future of Smallholder Agriculture?**

by

Nicholas J. Sitko, Jordan Chamberlin, and Brian Mulenga

Working Paper No. 100

October 2015

Indaba Agricultural Policy Research Institute (IAPRI)

Lusaka, Zambia

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Any views expressed or remaining errors are solely the responsibility of the authors. Comments and questions should be directed to:

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EXECUTIVE SUMMARY

Zambia, like many countries in Sub-Saharan Africa, has witnessed a recent expansion in the number of indigenously-owned farms greater than 20 hectares in size. The growth of the medium-scale farms is reshaping the agricultural landscape in Zambia and the prospects for achieving an inclusive, smallholder growth strategy. This paper examines the role played by medium-scale land acquisitions in shaping the Zambia's potential to achieve inclusive, agricultural-led growth. In particular, this article analyzes the spatial and socio-economic implications of medium-scale land acquisitions on land access, land ownership inequality, and land use in Zambia. By exploring these underappreciated dimensions of Zambia's on-going land rush, we hope to provide insights into the role of domestic land policies and land investors in shaping the future of Zambia's food system.

Data and Methods

We draw from nationally representative household survey data of small- and medium-scale farmers in Zambia. In particular, we draw on various Crop Forecast Surveys (CFS), the 2001 Supplemental Survey, and the 2012 Rural Agricultural Livelihoods Survey (RALS). To fill these gaps we rely on the Supplemental Survey 2001 and the RALS 2012. However, these surveys are only provincially representative, and therefore, cannot be used to assess changes at the district level.

In addition, we draw on a survey of medium-scale land holders conducted in 2011 by Sitko and Jayne (2014). The data presented here are, therefore, not nationally representative, but they do provide indicative findings on the emergent farming sector in districts where emergent farmers are concentrated.

Key Findings

- Between 2001 and 2014 the number of farms between 10 and 20 hectares grew at a rate of 79%.
- Farms of 10 to 100 hectares now control 34% of the land in the small- and medium-scale farming sector, up from 22% in 2001.
- Medium-scale farm growth is occurring in regions of the country where land inequality is already high.
- Land titling is occurring in the same regions where medium-scale farm growth is pronounced.
- Medium-scale farmers exhibit several important attributes that distinguish them from the average small-scale farmer: First, medium-scale land owners are better educated and more likely to be employed in the public sector than the average small-scale in Zambia, in jobs ranging from teachers, health workers, and agricultural extension workers on the one hand, to higher-level positions in government ministries, on the other. Second, a considerably larger share has alienated their land relative to small-scale farmers. Finally, the majority of medium-scale farmers used non-farm wage income to acquire their land, rather than farm income, and most of these land acquisitions have been recent.
- Medium-scale farmers have experienced faster income growth between 2001 and 2012 than small-scale farmers. Between 2001 and 2012, medium-scale farmers saw

their real gross income expanded by 150% compared to 95% for small-scale land owners.

- When land use patterns among medium-scale land owners are examined more closely a worrying trend emerges. As the area land ownership increases the share of land that it utilized for crop production declines substantially.

Conclusions

Medium-scale farm growth in Zambia is leading to an under-utilization of agricultural land and is stifling agricultural output per hectare, as many medium-scale land owners are utilizing a small portion of their available land for food production purposes, and achieving agricultural returns per hectares of land owned and cultivated that is a fraction of those attained by small-scale farmers. This raises additional concerns about the near-term implications of this land rush on aggregate food production and food prices.

Yet, the medium to long-term consequences of this land rush are more worrying still. Given the limited pace of wage labor market expansion, ensuring viable opportunities for small-scale farmers in the medium-term is essential if Zambia, and other African nations, are to cope with the large and growing number of young people entering the labor force each year. Through the alienation of land in high potential areas and the exacerbation of land inequality conditions, this domestic land rush is foreclosing the potential for future generations of small-scale farmer to acquire viable parcels of land, to link to a virtuous cycle of input intensification and output market engagement, and ultimately, to contribute to a smallholder-led economic transformation.

The ways in which medium-scale land owners are reshaping the agricultural landscape suggest that even in low density countries such as Zambia the capacity to utilize the agricultural sector and agricultural spending to achieve broad-based growth and poverty reduction objectives are fundamentally tied up with land policy. As African food production comes to play an increasingly important role in the future of the global food system, it is critical that domestic policy-makers and international donors recognize the important intersections between land policy, land distribution, and agricultural development outcomes. In order to meaningfully affect the enduring problems of rural poverty and hunger requires a more explicit recognition of how land policies are shaping the current and future prospects of Africa's rural poor.

Recommendations

What can be done from a policy perspective to retain viable land access opportunities for existing small-scale farmers without stifling potentially valuable domestic investment in agriculture? An important place to begin is to provide a clear framework for protecting the land rights of current small-scale farmers, particularly in regions witnessing significant domestic investor interest in land. This may entail:

1. Land mapping exercises with traditional authorities, which can demarcate small-scale farming areas and areas where external investments can occur.
2. Change in land taxation systems for titled land. Land taxes in Zambia are currently negligible for land title holders. This allows individuals with no immediate interest in

utilizing land to acquire it and sit on it for years. Increasing land taxes will increase incentives to invest in land and will limit speculative acquisitions.

3. Zambia needs to implement an overarching land policy that seeks to balance the social and economic objectives of the country. Until a land policy is in place, pressure from domestic investors to acquire valuable farm land will continue unabated, to the detriment of future generations of small-scale farmers.

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ACRONYMS

CAADP	Comprehensive African Agricultural Development Programme
CFS	Crop Forecast Surveys
CSO	Central Statistical Office
GDP	Gross Domestic Product
IAPRI	Indaba Agricultural Policy Research Institute
kg	kilogram
MACO	Ministry of Agriculture and Cooperatives, Zambia
MAL	Ministry of Agricultural and Livestock
NEPAD	New Partnership for Africa's Development
OECD	Organization for Economic Cooperation and Development
RALS	Rural Agricultural Livelihoods Survey
SSA	Sub-Saharan Africa
SS	Supplemental Survey

1. INTRODUCTION

Land in Sub-Saharan Africa (SSA) occupies an increasingly prominent and contested place in debates over food security, the future of the global food system, and appropriate economic development strategies. After decades of low global food prices, the 2007/08 global food price spike prompted many to question the global food system's capacity to meet future food demand in the context of peak oil, diminishing soil and water resources, and climate change (McMichael 2009; Cotula 2013). As uncertainty in the global food system mounts, Sub-Saharan Africa is seen as the *last frontier of global agriculture*; a massive region, largely left out of the green revolution, with low aggregate population densities, and ample water resources (Thurow 2010). As this new narrative unfolds, the intensification of agricultural production on African land is increasingly seen an important element in ensuring that global food supplies keep pace with growing demand. As investments in African land accelerate, the conditions under which small-scale farmers control and access land are changing.

Most academic and media attention on the growing interests in African land and land intensification has focused on two divergent investment areas. The first is the rapid increase in global investments in African land for the large-scale production of food and fuel crops (Deininger and Byerlee 2011). Schoneveld (2014) provides the most recent and well-documented analysis of the scale of these investments in Africa. He identifies a total of 563 large-scale land acquisitions comprising 22.7 million hectares in Africa since 2005. This is a relatively conservative estimate, because he excludes acquisitions smaller than 2,000 hectares. That said, this conservative estimate is equivalent to 9.6% of the total area under cropland in SSA in 2012 (according to FAOSTAT), and roughly 11% of the roughly 200 million hectares of the potentially available cropland in SSA (Deininger and Byerlee 2011). The scale and pace of these acquisitions have raised concerns about their current and future effects on land availability for small-scale agriculture (Cotula 2013; Woodhouse 2012).

The second strategy involves a substantial reinvigoration in donor and domestic government spending to increase food crop productivity on small-scale farms. In the wake of the 2008 G8 L'Aquila joint statement on food security, OECD countries ramped up spending on agricultural development. As of 2011 OECD countries had allocated \$11.7 billion to food and nutrition security spending, up 49% from 2002 in real terms (Mowlds, Nicol, and Cleirigh 2012). As a result, food and nutrition security spending makes up about 7% of overseas development assistance from the OECD, 61% of which is spent on agricultural development (2008-2010). As of 2009/10, Sub-Saharan Africa received 41% of this total spending. At the same time, the NEPAD-led Comprehensive African Agricultural Development Programme (CAADP) has help spur some African governments to increase domestic spending on agriculture, primarily through increases in large-scale input subsidy programs (Benin and Yu 2012).

In many ways, these divergent investment waves in African land and agricultural production reflect broader debates over what the appropriate scale of production is for meeting domestic food and food security policy objectives and enhancing stability in global food markets. On the one hand, many development economists argue that igniting a new green revolution in Africa, through targeted investments in seed, fertilizer, and output markets for small-scale farms, is the most effective way of transforming food systems and economies in the region (Diao, Headey, and Johnson 2008; Djurfeldt et al. 2005). On the other hand, there is a growing minority who argue that the combined challenges of rapid urban food demand growth, climate change, and persistent stagnation in African small-scale production systems

require new approaches, including the expansion of commercial agricultural production on the continent (Collier and Dercon 2014).

Largely unrecognized in these stylized debates over commercial versus small-scale production is the growing population of medium-scale farmers in SSA. These are farmers that own or control more than 5 hectares and generally less than 100 hectares of land. They are differentiated from traditional small-scale farmers by the scale of their land holdings; among small-scale farmers in SSA the vast majority (~70%) controls less than 2 hectares of land (Hazell et al. 2010). Yet in most cases these medium-scale farms lack the hallmarks of commercial farming operations in the region, including utilization of production financing, crop irrigation, and mechanization. As shown by Jayne et al. 2014, several countries in SSA have, over the last decade, witnessed a meteoric increase in the number of medium-scale farmers. While this may reflect a process of land consolidation associated with economic transformation (Pingali 1997), there are reasons for concern. Case studies and media reports from the region suggest that an important drivers of the growth in medium-scale farms is land acquisitions by wage earners, often for speculative purposes or for future use in retirement, not agricultural-led consolidation (Sitko and Jayne 2014; Muyanga and Jayne 2014; Moyo 2015). While land consolidation among are relatively elite minority is not a new phenomenon in much of Africa (see Berry, Downs, and Reyna 1988; Bruce 1988; German, Schoneveld, and Mwangi 2013), the scope and scale of this process is (Jayne et al. 2014). As medium-scale land acquisitions reshape the African agricultural landscape, they are likely to have important implications on the effectiveness of donor and domestic government spending to achieve broad-based growth outcomes and the repercussions of large-scale land acquisitions on the future of small-scale agriculture.

As global and domestic interest in securing access to African land increases, important questions emerge about the consequences of this largely unnoticed middle-tier land rush in SSA on the future of African agriculture. Using data from Zambia, this article examines the role played by medium-scale land acquisitions in shaping the potential to achieve inclusive, agricultural-led growth. In particular, this article analyzes the spatial and socio-economic implications of medium-scale land acquisitions on land access, land ownership inequality, and land use in Zambia. By exploring these underappreciated dimensions of the African land rush, we hope to provide insights into the role of domestic land policies and land investors in shaping the future of Africa's food system.

The remainder of the article is organized as follows. Section II details the data used in this article. This is followed by a detailed description of the political economic context of the growth of medium-scale land holders in Zambia. In Section IV we analyze various spatial dimensions of the expansion of medium-scale land holdings, with particular attention to its relationships with land access, land alienation, and land inequality conditions in high potential agricultural areas. Section V explores the socio-economic characteristics and land use patterns of these medium-scale land holders, relative to small-scale farmers in Zambia. Section VI offers concluding remarks.

2. DATA AND METHODS

In this article we draw from nationally representative household survey data of small- and medium scale farmers in Zambia. In particular, we draw on various Crop Forecast Surveys (CFS) (CSO/MAL various years), the 2001 Supplemental Survey (SS) (CSO/MACO/FSRP 2001), and the 2012 Rural Agricultural Livelihoods Survey (RALS) (CSO/MAL/IAPRI 2012). The CFS is carried out annually by the Ministry of Agriculture and the Central Statistical Office. It is the largest survey of agricultural households in Zambia, with average household sample sizes of over 12,000 households. The sample frame for the CFS allows for the generation of district representative data on small- and medium-scale farms. However, the CFS suffers from several limitations. First, the CFS did not collect data on total land holdings until 2009. As such, information on total land holding, which we use to categorize medium and small-scale farms, is not available at a district level until 2009. Second, the CFS does not collect data on important dimensions of rural livelihoods such as off-farm income and livestock ownership. To fill these gaps we rely on the Supplemental Survey 2001 and the RALS 2012. However, these surveys are only provincially representative, and therefore, cannot be used to assess changes at the district level.

The CFS, Supplemental Survey, and RALS collect data on the smallholder farming sector in Zambia. For the purpose of these surveys, a smallholder household is defined as cultivating less than 20 hectares of land. Therefore, the surveys include farmers that own more than 20 hectares of land, but cultivate 20 hectares or less. This leads to a systematic oversampling of farmers that under-utilize their land. While we acknowledge this limitation, its overall effect on the subsequent analysis is limited. When we calculate the number of households excluded from enumeration in the CFS due to land cultivation size, we find that only 0.02% of listed households exceeded the 20 hectare cultivation limit for enumeration. Therefore, we do not anticipate that this land cultivation limit significantly effects the overall conclusions from the data. However, due to this selection criterion these surveys have limitations with regards to our analysis. However, additional concerns with the data exist. First, because only households that have cultivated some portion of their land are included, these surveys exclude individuals who have acquired land that is sitting idle. Second, these surveys may fail to capture data on households that own land but whose primary residence is urban. Finally, these surveys do not capture the timing of land acquisitions, the income source used to finance land acquisitions, or previous employment information.

To fill this gap, we draw on a survey of medium-scale land holders conducted in 2011 by Sitko and Jayne (2014). This survey was carried out with 183 individuals with land holdings of five or more hectares. The survey was administered in July 2011 in four districts in Zambia: Mumbwa, Choma, Kalomo, and Mpongwe. The four districts were purposively selected based on the concentration and number of emergent farmers in the 2010/11 CFS. To ensure a reasonable concentration to sample from, at least 3% of all farmers in the district had to be classified as emergent farmers. We selected districts along a continuum of concentrations to ensure geographic diversity in the sample. However, it is important to note that emergent farmers are overwhelmingly concentrated in districts that are in close proximity to the *line of rail* and the urban mining areas of the Copperbelt. Of the 72 District in Zambia, Kalomo District had the highest concentration of emergent farmers in the country (15%), Mumbwa had the third highest concentration with 9%, Mpongwe was tied for seventh with 5%, and Choma was tied for ninth with a 3% concentration level. Farmers meeting were randomly selected from farmer contact lists kept by the Zambian National Farmers Union (ZNFU) and the District Agriculture and Cooperatives Office (DACO). While in all

likelihood these lists are not exhaustive, they provided the only viable means for randomizing our sample of emergent farmers in each of the districts. The data presented here are, therefore, not nationally representative, but they do provide indicative findings on the emergent farming sector in districts where emergent farmers are concentrated.

3. THE CONTEXT OF MEDIUM-SCALE FARM GROWTH: LAND POLICIES, AGRICULTURAL SPENDING, AND ECONOMIC CHANGE

Before examining the domestic land rush in Zambia, it is important to first situate it in the context of Zambia's land administration policies, agricultural public spending, and on-going economic transformations. Like much of SSA, Zambia's land is administered through what Mamdani (1996) referred to as a bifurcated system of land administration. On the one hand, so-called state land is allocated to individuals or corporations on long-term transferable leases administered by the central government. On the other hand, customary lands are allocated on a usufruct rights basis through a system of traditional authorities, such as chiefs and headmen. Apart from these broad designations, however, there is very limited coordination or clarity regarding land administration in Zambia (see Sitko, Chamberlin, and Hichaambwa 2014 for a detailed historical account of Zambia's land policies). Indeed, Zambia does not have an overarching land policy in place, and has not had one for decades.

Complicating the policy vacuum for land is Zambia's 1995 Land Act, which provides the legal framework to convert customary land to leasehold title, but does not spell out its socio-economic goals or objectives. Under the 1995 Land Act, traditional authorities can grant consent to individuals or corporations to convert land under their authority to leasehold title. After a perfunctory approval from the District Council the land is permanently removed from customary control, and becomes both transferable and collateralizable. Under this system, there are virtually no legal protections for customary rights holders on land designated for alienation, no system for tracking the quantities and locations of land removed from customary control, and no obvious mechanism for local resident to alienate their land (Sitko, Chamberlin, and Hichaambwa 2014; Brown 2005; Nolte 2014). The interaction of formal statutory bodies and informal institutions, including land allocation system among traditional authorities that are rarely codified, leads to conversion processes that are opaque and subject to significant manipulation by more powerful segments of society (Nolte 2014). There is evidence suggesting that wealthy Zambian urbanites approach traditional authorities and offer payments in return for the traditional authorities' consent to alienate land to foreign investors (Nolte 2014). This is likely a similar process by which medium-scale domestic land investors acquire and alienate land. As shown by Sitko, Chamberlin, and Hichaambwa (2014) land title acquisition by small- and medium-scale farmers is a function of, among other things, being considered non-local to the area, having higher levels of education, and having access to wage income, particularly from the public sector. Thus, higher levels of financial and social capital appear necessary to navigate the existing system for alienating land in Zambia.

The legal capacity to alienate customary land, coupled with the continued lack of a broader policy regulating land use and administration, coincides with sweeping socio-economic changes in Zambia. Over the last decade Zambia has experienced gross domestic product (GDP) growth rates of over 6%, making it one of the fastest growing economies in the world. This has contributed to the rise of a Zambian middle class, yet has failed to improve incomes for the majority of the population, particularly those in rural areas where headcount poverty rates hover at nearly 80%. For the purpose of this discussion two facets of this growth in income inequality deserve attention. First, a large segment of Zambia's wage earning population has seen their disposable income increase substantially, but without a similar increase in investment opportunities. With land policies favorable to low cost land acquisition and alienation, land has become an increasingly attractive investment asset for wage earners with disposable incomes (Sitko and Jayne 2014). Second, with wage incomes growing and urban populations expanding, domestic food demand is growing, and is projected to continue

to grow substantially (Tschirley et al. 2014). As a consequence of these factors, Zambia has witnessed a transformation in incentives to invest in agricultural land acquisitions and the wherewithal to do so.

Coupled with an ill-defined system of land alienation and administration is an agricultural public spending portfolio that has shifted substantial toward providing input and output market subsidies for maize cultivation. Beginning in 2008 the Government of Zambia began allocating between 50 to 80% of the total agricultural budget to maize subsidy programs (Sitko and Kuteya 2013). While this expansion of subsidies has helped push Zambia above the 10 percent budget target set by CAADP, these subsidies disproportionately favor larger land holders, with the capacity to cover the cost sharing components of the input subsidy program and to produce surplus maize to sell to the government's Food Reserve Agency at above market prices.

Table 1 presents the distribution of participation in the input subsidy program (proxied for by subsidized fertilizer) and quantities of maize produced by land groups. What is clear is that while medium-scale farmers make up a small share of the rural population, they capture a majority of government spending on agriculture. For example, in Column D shows the average kg of fertilizer a household receives from the government's Farmer Input Support Programme. This program is designed to provide 200 kg of fertilizer to so-called vulnerable but viable small-scale farmers. Yet, as shown in Column D, farmers with less than 5 hectares of land receive on average less than the prescribed fertilizer amount, while medium-scale farmers acquire more the prescribed amount. This is a direct result of targeting criteria that favor wealthier, larger-scale producers, and make it virtually impossible for poor, small-scale producers to participate (Mason, Jayne, and Mofya-Mukuka 2013).

This targeting of larger, better-off farmers is an explicit attempt to ensure national food security in maize, measured in terms of aggregate surplus maize production. With a history of maize price riots leading to political change, Zambian policy-makers tend to focus myopically on national maize supplies to ensure their political legitimacy (Sitko 2013).

Table 1. FISP Fertilizer Received (2010/11 Drop Season) and Expected Maize Sales, 2011, by Farm Size Category

Total Area Cultivated (Maize + All Other Crops)	Number of Farms (A)	% of Farms (B)	% of Farmers Receiving Subsidized Fertilizer (C)	Kg of Subsidized Fertilizer Received per Farm Household (D)	% of Total Subsidized Fertilizer by Land Size (E)	% of Farmers Expecting to Sell Maize (F)	Expected Maize Sales (Kg/Farm Household) (G)
0-0.99 ha	596,334	39.6%	14.3%	24.1	12%	22.2%	135
1-1.99 ha	499,026	33.1%	30.6%	69.3	30%	47.7%	609
2-4.99 ha	354,116	23.5%	45.1%	139.7	43%	64.0%	1,729
5-9.99 ha	49,410	3.3%	58.5%	309.7	13%	82.1%	6,613
10-20 ha	6,999	0.5%	52.6%	345.6	2%	86.8%	15,144
Total	1,505,885	100%	28.6%	77.1	100%	42.7%	950

Source: MACO/CSO Crop Forecast Survey 2010/11. Reproduced from Jayne et al. 2011

Yet, because poverty and food insecurity is concentrated among small-scale farmers, this spending regime has proven incapable to effectively driving down rural poverty or improving food insecurity outcomes (Jayne et al. 2011),

With supportive agricultural public spending policies and conducive land alienation policies, Zambia has witnessed rapid growth in medium-scale landownership and resultant land concentration. As shown in Table 2, the majority of Zambia’s farms is less than five hectares in size and has, since 2001, seen an annual growth rate commensurate with population growth of 2.5%. Conversely, medium-scale farmers with five hectares and more, and particularly those over 10 hectares, have seen growth rates outstripping normal population growth. As a result of this rapid growth, the share of farmland in Zambia controlled by the medium-scale minority has expanded considerably. While medium-scale land owners still make up only 18% of the farming population, as of 2014 they controlled over 57% of the total farmland in the sector. If the commercial farm sector were included the total share of farmland controlled by the 1.1 million household with less than 5 hectares of land would be even lower.

On the face of it, the consolidation of agricultural land in Zambia by medium-scale farmers may be read as a positive transformation; one that is consistent with the stylized narrative of small-scale farmer-led process of land accumulation and consolidation resulting from economic structural transformation (Pingali 1997; Johnston and Mellor 1961). Drawing primarily on analysis from the Green Revolution experience in Asia, the literature on economic structural transformation outlines a fairly linear process by which agricultural productivity growth on small-scale farms transforms largely agrarian economies into more industrial ones. The stylized facets of this transformation are: (i) the process starts with agricultural productivity growth among the rural majority of small-scale producers; (ii) small-scale but productive farmers with sufficient land to produce a surplus will lead this process; (iii) the money that they mobilize from their surplus production and spend stimulates demand for goods, services and jobs in the various off-farm sectors of the economy, which induces rural-urban migration, gradual urbanization, and a slow or negative rate of population growth in rural areas.

Table 2. Changes in Farm Structure Among Small- and Medium-scale Farmers in Zambia (2009-2012)

Landholding Size	Number of Farms			% Change (2001-2014)	% of Total Small- and Medium-scale Land	
	2001	2009	2014		2009	2014
0 – 2 ha	597,310	916,787	762,685	27%	24.1%	15.3%
2 – 5 ha	339,165	366,628	434,035	28%	33.8%	26.9%
5 – 10 ha	125,103	110,436	176,533	41%	20.3%	23.5%
10 – 20 ha	36,799	35,898	65,737	79%	12.3%	17.1%
20 – 100 ha	13,056	9,030	19,320	48%	9.5%	17.2%
Total	1,111,433	1,438,779	1,458,310	31%	100.0%	100.0%

Source: CSO/MACO/FSRP 2001; CSO/MAL 2009 and 2014.

Agriculture becomes a declining sector as its share of total GDP falls over time. Over time, consolidation of farmland occurs as rural areas gradually depopulate and more efficient producers rent or buy land from their less efficient neighbors, who leave agriculture and migrate to cities (Mellor 1976; Johnston and Kilby 1975). Yet, given the political economic context of this growth, and the pace at which it is occurring, there are concerns that it may reflect a more worrying and nefarious process. To better understand the implications of the rapid consolidation of agricultural lands by a medium-scale minority of farmers, we explore the spatial relationships between this process and broader conditions of smallholder land access, land inequality, and land alienation.

4. THE GEOGRAPHIC DIMENSIONS OF MEDIUM-SCALE FARM GROWTH

Zambia is a large country, covering approximately 750,000 km², with a low average population density of less than 20 people per km². Yet, a large segment of this population is clustered around the major infrastructure routes, called the line of rail, stretching from the south of the country, through the capital city Lusaka, then branching east to the Tanzanian border and west through the industrial region of Zambia's Copperbelt (Figure 1). The importance of the line of rail to Zambian economic life cannot be overstated. For agriculture, proximity to the line of rail is critical for accessing markets, as transactions costs increase marketed as distance from the line of rail increases. Thus, land access and availability for small-scale farmers along the line of rail is of critical importance to processes of agricultural commercialization.

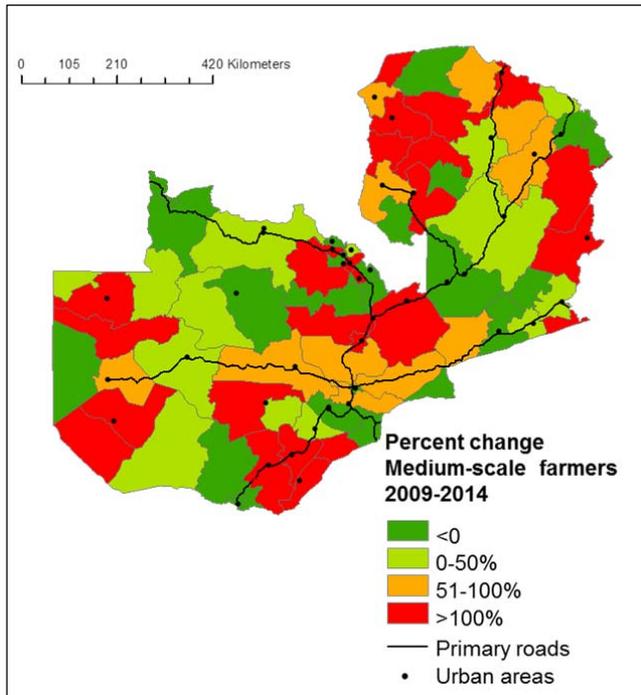
In this section we explore how the rapid growth in the number of medium-scale farmers in Zambia is reshaping the distribution of land and its availability to small-scale producers. Figure 2 presents a district-level map of percent changes in the share of medium-scale farmers to the total small- and medium-scale farming population. It shows that the growth in the share of medium-scale farmers is geographically dispersed, but exhibits clustering around major urban centers along the line of rail. The medium-scale farm growth in the higher density, market accessible regions of the country are of particular interest for the future of small-scale agriculture. These are the regions where the majority of small-scale farmers are clustered (Jayne, Chamberlin, and Headey 2014) and where market access conditions are most likely to favor an agricultural-led commercialization process. As a result of superior market access conditions, these are also the areas where domestic and foreign investment interest in land is likely to be the most acute. As will be shown below, the growth of medium-scale farmers exhibits important spatial relationships with land ownership inequality, deteriorating land access conditions, and increased levels of land alienation.

Figure 1. Zambia's Line of Rail



Source: Authors.

Figure 2. Percent Change in Number of Medium-scale Farms Relative to the Total Small- and Medium-scale Population 2009-2014

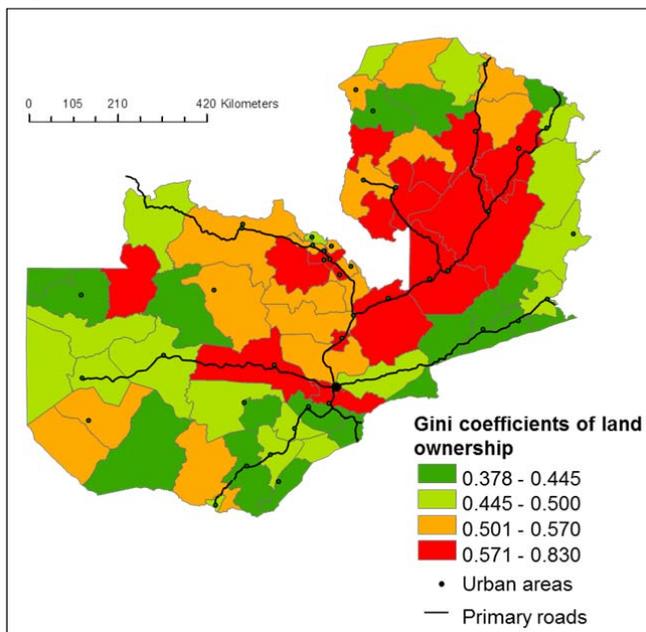


Source: CSO/MAL 2009-2014.

The growth in medium-scale farmers has a spatial relationship with land ownership inequality. In 2009 the Gini coefficient for land in Zambia's small- and medium-scale sector stood at 0.56. This represents a significantly higher level of land inequality than the 0.50 in Latin America, where land inequality was considered a major constraint to agricultural-led poverty reduction (Deininger and Squire 1998). As shown in Figure 3, land inequality in Zambia has a discernible geographic pattern; land inequality is highest along the major road infrastructure from the capital Lusaka, northwest to the urban centers of the Copperbelt and northeast toward the Tanzanian border. These are regions with reasonably good access to domestic urban and cross border markets, as well as more stable intra and inter-seasonal rainfall patterns (Jones and Thornton 2003). Land inequality is relatively low in the high density rural areas of the Southern and Eastern Provinces, where land fragmentation has likely helped to equilibrate land holding sizes overtime, and in the low density Western Province.

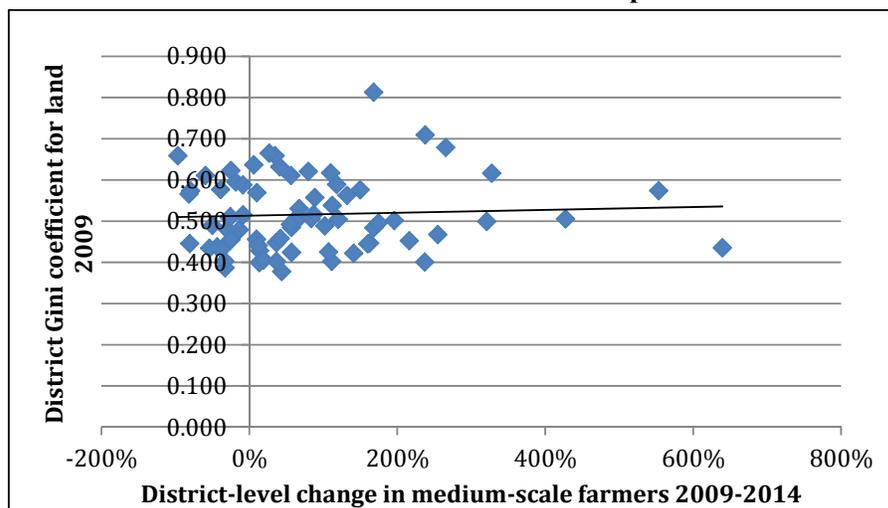
This pattern of land inequality suggests that significant numbers of larger land holdings are clustering alongside very small farms in regions with the greatest agro-climatic and market access conditions for successful agricultural commercialization under rain-fed conditions. While we cannot determine causal relationships between changes in medium-scale farm populations and district-level Gini coefficients, we do observe a statistically significant correlation between Gini coefficients for land at the start of our period of analysis (2009-2014) and changes in the share of medium-scale farmers to the total smallholder farming population over that period at the 0.05 level. These bivariate relationships are presented in Figure 3. In other words, at a district level, growth in medium-scale farmers is in many cases occurring in precisely the same districts where land inequality was already the highest in 2009.

Figure 3. Gini Coefficient of Small- and Medium-scale Land Holdings by District, 2009



Source: CSO/MAL 2009.

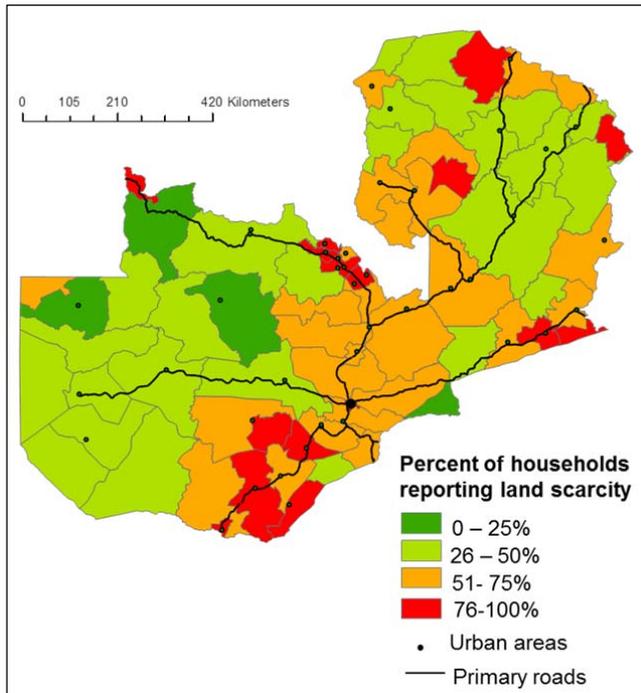
Figure 4. Scatter Plot of District-level Land Gini Coefficients by Changes in the Share of Medium-Scale Farms to Total Smallholder Population



Source: CSO/MAL Various Years.

In addition to fairly high levels of land inequality, a majority of Zambian farmers also report constraints to land access. At a national level 54% of small- and medium-scale indicate that local traditional authorities do not have land to allocate to local residents. Although we do not have district-representative figures on reported land scarcities, as these questions are not asked in the CFS, Figure 5 presents indicative data from the RALS on where reported land scarcities are most acute. It shows that there is considerable overlap between districts with high levels of land inequality and the incidence of reported land scarcities.

Figure 5. Percent of Small- and Medium-scale Farmers Reporting that Land Local Traditional Authorities no Longer Have Land to Allocate to Resident



Source: CSO/MAL/IAPRI 2012.

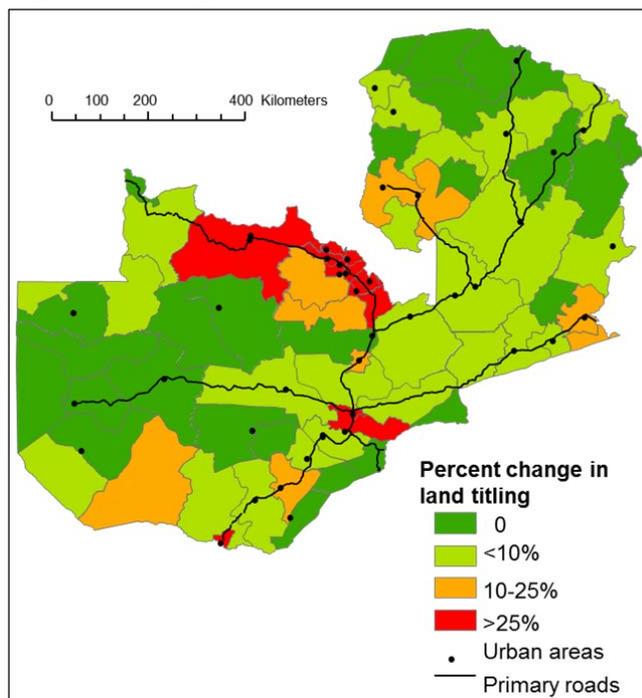
While the highest incidences of reported land scarcities occur in the high density Southern and Eastern Provinces, Figure 5 shows that in the large, and low density districts north of the capital, where Gini coefficients are particularly high, reported land scarcities exceed 50 percent of the rural population.

Enabled by the 1995 Land Act, Zambia has witnessed a significant increase in the incidence of land titling within the small- and medium-scale farming sector. Based on data collected by the Ministry of Lands and presented in Sitko and Jayne (2014), a total of 5098 land conversions have been recorded between 1995 and 2012, amounting to approximately 280,000 ha of customary land that is now administered through leasehold title by individuals for agricultural purposes. This represents a 3-fold increase over the previous decade. As of 2012, 10% of all small and medium-scale land was titled (Sitko, Chamberlin, and Hichaambwa 2014). The geographic dimensions of land alienation are important. Figure 6 presents illustrative, though not representative data, on the rates of change in land titling between 2001 and 2012. District representative data on land titling are not available. That being said, Figure 6 indicates that the rates of change in land titling are high for most districts along the main infrastructure corridors, and are particularly high in the areas surrounding the major urban centers of Lusaka and the Copperbelt. This indicative pattern of land alienation closely coincides with incidences of land inequality. At a district-level, we find that changes in the percent of farms with land titles are correlated (0.405) with Gini coefficients of land ownership in 2009 at a 0.001 level of significance. These relationships are presented graphically in Figure 7. Though the data available are limited, this pattern suggests that land alienation is occurring at the highest rate in the same places where land inequality is the most pronounced.

Given the opaque ways in which land is alienated in Zambia’s customary areas, the increased prevalence of land titling in areas where land inequality is most pronounced is worrying. Land alienation processes in Zambia have been shown to exclude the existing small-scale farm population in favor of outside domestic investors (Sitko, Chamberlin, and Hichaambwa 2014). Given that land inequality is highest in regions with the highest agricultural commercialization potential, land alienation processes in those areas will likely further marginalize small-scale farmers from agricultural growth opportunities. Moreover, because levels of inequality are endogenous to the poverty reduction potential of economic growth, the dual processes of land alienation in already unequal regions will undermine the future capacity for agricultural growth to put a dent in rural poverty.

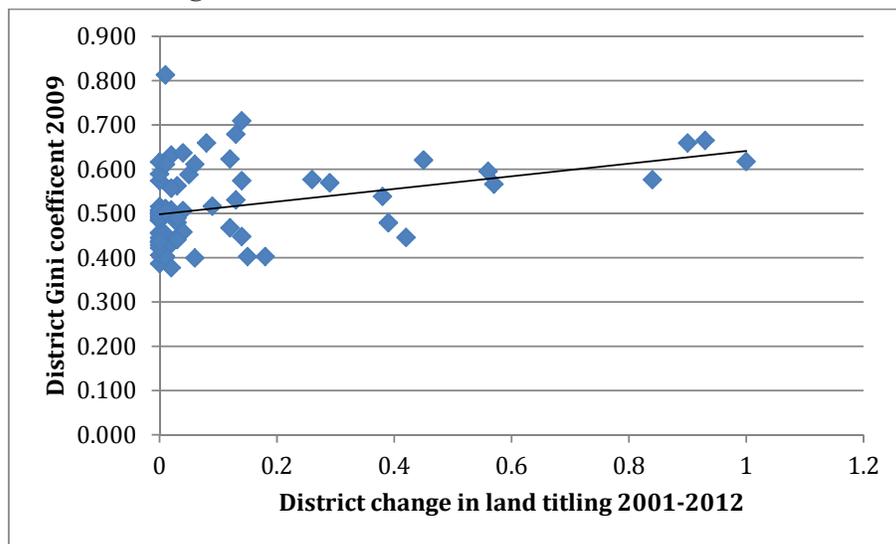
Taken together, the geographic dimensions of the on-going land rush in Zambia suggest that in the areas where the components for a smallholder commercialization process are most likely to be successful— regions in close proximity to input and output market— are precisely the places where we see land access constraints becoming pronounced, land inequality rising, and land alienation proceeding rapidly. It is clear that as these transformations deepen, the capacity for a broad-based agricultural growth process to take hold in these viable agricultural areas will become increasingly constrained. What is less clear, however, is whether or not these transformations can help to reshape Zambia’s food system in beneficial ways.

Figure 6. Change in Percent of Farms with Land Title 2001-2012



Source: CSO/MAL/IAPRI 2012; CSO/MACO/FSRP 2001.

Figure 7. Scatter Plot of District-level Changes in Gini Coefficients, 2009, and Changes in Land Titling 2001-2012



Sources: CSO/MAL 2009; CSO/MACO/FSRP 2001; CSO/MAL/IAPRI 2012.

5. CHARACTERISTICS OF MEDIUM-SCALE FARMERS

To understand the implications of the growth of the medium-scale land owners on Zambia's agricultural growth potential, we need to examine their socio-economic and land use characteristics relative to the average smallholder. Table 3 compares data on medium-scale land owners collected in 2011 by Sitko and Jayne, with RALS household survey data on small-scale farmer¹. Several important points emerge from this comparison. First, medium-scale land owners in the Sitko and Jayne survey are better educated and more likely to be employed in the public sector than the average small-scale in Zambia, in jobs ranging from teachers, health workers, and agricultural extension workers on the one hand, to higher-level positions in government ministries, on the other. Second, a considerably larger share has alienated their land relative to small-scale farmers. Finally, though comparative data are not available from RALS, Sitko and Jayne (2014) find that the majority of medium-scale farmers in their survey used non-farm wage income to acquire their land, rather than farm income, and most of these land acquisitions have been recent. Taken together, this comparison suggests that wage income growth, particularly from public sector employment, is driving a significant share of the expansion of medium-scale land ownership in Zambia. Moreover, these wage earners appear to be utilizing their knowledge of bureaucratic systems, derived from public sector employment, to navigate opaque systems for acquiring land titles, a point supported by a recent analysis of the determinants of title acquisitions in Zambia (Sitko, Chamberlin, and Hichaambwa 2014).

The relationship between off-farm wage income and the land acquisitions among medium-scale land owners shown in Table 3 helps to explain the changes in household income and income inequality within the smallholder sector. Table 4 shows the percent change in real household income for medium-scale and small-scale land owners between 2001 and 2012. Several points are worth noting in this table. First, while both have seen an increase in real gross incomes, the pace of change for medium-scale land owners is considerably faster. Between 2001 and 2012, medium-scale farmers saw their real gross income expanded by 150% compared to 95% for small-scale land owners. This widening inequality is driven by more rapid increases in both agricultural and non-farm income.

Table 3. Socio-economic Comparisons of Medium-scale and Small-scale Land Owners

	Medium-scale	Small-scale
Percent that used primarily off-farm income to acquire land	57%	n/a
Percent with title to their land	22%	8.4%
Average year of first land acquisition	2005	n/a
Percent employed in public sector	37%	4.7%
Average duration of employment	8.5 years	n/a
Average year of education HH	10.2	5.8

Source: Medium-scale farmer data comes from Sitko and Jayne 2014 (N=183); Small-scale data come from CSO/MAL/IAPRI 2012.

¹ We use medium-scale farmer data from Sitko and Jayne (2014) for several reasons. First, it provides historical background on land acquisitions and income sources not available in nationally representative household survey data. Second, the sample frame for Sitko and Jayne (2014) included farmers with larger land holdings that are excluded from household survey data. Finally, Sitko and Jayne (2014) collected data in districts where medium-scale farm growth has been most dynamic, thus providing insights into the attributes of new medium-scale farms.

Table 4. Percent Change in Average Real Income for Small- and Medium-scale Farmers by Source 2001-2012

	Gross Household Income	Gross Household Agricultural Income	Gross off-farm Household Income	Household Wage Income
Small-scale	94.7%	129.6%	70.9%	55.7%
Medium-scale	152.1%	212.6%	85.7%	145.8%
Difference	57.4%**	83.0%**	14.8%*	90.0%***

Source: Authors' calculations from CSO/MACO/FSRP 2001 and CSO/MAL/IAPRI 2012; CPI comes from Zambian Central Statistical Office. *Sig. 0.10 **0.05***0.001.

Of particular interest is the considerably faster pace of growth in wage incomes among medium-scale land owners. Over the period 2001 to 2012, they have seen average real wage income increase at a rate that is 90% faster than in the small-scale sector. This is indicative of an influx of wage earning capital into the medium-scale sector.

As shown by the rapid pace of growth in real agricultural incomes among medium-scale farmers, they appear to be having a beneficial effect on aggregate agricultural production and agricultural GDP growth in Zambia. Yet much of this related to favorable agricultural spending on medium-scale farmers. As shown by Mason, Jayne, and Myers (2012), medium-scale farmers have considerably higher supply elasticity to maize prices than small-scale farmers. As the government's spending on output price subsidies for maize have increased, medium-scale farmers have responded. Mason, Jayne, and Myers (2012) estimate that every 100 kwacha increase in government subsidy prices for maize trigger a 41.24 kg of maize response from medium-scale farmers, compared to a 4.29-8.47 kg response from small-scale farmers.

With significant subsidy support and access to wage income, medium-scale farmers are in a better position than most small-scale farmers to intensify production of low cost cereals through the acquisition of capital intensive inputs and the achievement of greater economies of scale in production and marketing. However, when land use patterns among medium-scale land owners are examined more closely a worrying trend emerges. As shown in Table 5, as the area land ownership increases the share of land that it utilized for crop production declines substantially. Even when assuming a high fallow rate, the share of land that is controlled by the medium-scale farm sector that is sitting idle is astounding. As a result, the total value of agricultural production, including the value of livestock owned by the household, per hectare is a quarter of that achieved by small-scale farmers (Table 6). Moreover, as shown in Column d of Table 6, when we calculate the value of production per hectare cultivated for small- and medium-scale farmers we find that small-scale farmers tend to achieve greater returns per hectare cultivated. This finding is consistent with much of the inverse productivity literature, which shows that small-scale producers achieve greater returns per hectare than larger scale producers (Lipton 2009; Larson et al. 2014). This difference likely reflects some combination of the production of higher value crops by land poor farmers, and greater management intensity.

Table 5. Share of Land Cultivated by Landholding Size

Landholding Size Category	Share of Landholding Cultivated (2014)
0 – 2 ha	85%
2 – 5 ha	66%
5 – 10 ha	48%
10 – 20 ha	35%
20 – 100 ha	12%

Source: CSO/MAL 2014.

Table 6. Average Gross Value of Agricultural Production (Crop+Livestock, Crop, and Livestock) Per Hectare Owned and Hectares Cultivated (2012 ZWK)²

	Crop and Livestock Per Hectare Owned	Crop Value Per Hectare Owned	Livestock Value Per Hectare Owned	Crop and Livestock Per Hectare Cultivated
	(a)	(b)	(c)	(d)
Small-Scale	8,036,705.67	7,093,641.96	943,063.71	8,284,821.38
Medium-Scale	2,250,099.34	2,048,161.97	201,937.37	4,438,178.97

Source: CSO/MAL/IAPRI 2012.

This pattern of land use suggests that medium-scale farmers lack the capacity, the incentives, the inclination, or some combination of the three to bring more of their land into use. The specific reason for the under-utilization of land by medium-scale farmers likely varies spatially. In regions with good access to markets and infrastructure, where agricultural returns are likely the highest, a lack of incentives to invest in agriculture is an unlikely candidate. Instead, under-utilization of land in these high potential regions more likely represents the high opportunity costs of dedicating time and energy to managing a farm relative to time dedicated to wage income opportunities. Indeed, that many of these individuals acquired land using off-farm sources, alienated it, and are now letting much of it sit idle, suggests that a large share of these acquisitions are likely for either speculative purposes or for use after retirement. This is worrying, not only because of the high level of land inequality and land access constraints in these regions, but also because it is unclear if this land is being held for future agricultural purposes.

² Crop and livestock values are computed by taking the total crop production during the survey reference period and the number of animals owned and the quantity of animal products (i.e., eggs, milk, and wool) and multiplying these by district median prices for the reference period.

6. CONCLUSIONS

Strategies to increase agricultural productivity on African land are thought to occur through one of two primary pathways; by attracting investment in large-scale commercial production or through intensification on existing smallholder plots. While considerable sums have been spent to further each of these strategies, and considerable ink spilled in defending or opposing them, an under-recognized transformation is taking place that will have important implications on both. The rapid expansion of medium-scale landholders in Zambia, and indeed in other countries in the region (Jayne et al. 2014), is altering the agricultural landscape in ways that may place boundaries on the feasibility of a smallholder-led agricultural growth strategy and will exacerbate the land availability implications of large-scale land acquisitions. Recognizing the causes and consequences of this middle-tier landholding transformation is critical if African agriculture growth is to achieve outcomes that are consistent with the stated poverty reduction, food security, and economic growth objectives of policy-makers.

This article has shown that the expansion of medium-scale farmers in Zambia is, in part, driven by an on-going domestic land rush. This rush is characterized by a growing segment of wage earners utilizing permissive and opaque land policies to acquire, and in many cases alienate, sizeable tracts of land. Growth in the share of medium-scale land owners and processes of land alienation are occurring in places where land inequality is particularly pronounced. These are the same places that, due to favorable market access and rainfall conditions, also hold the highest potential for agricultural commercialization. Moreover, in some areas of the country, these landscape transformations are occurring in tandem with foreign-owned land acquisitions, thus further exacerbating land access and inequality challenges.

Agricultural spending by the government of Zambia is also an important driving force in this transformation. A significant escalation of spending of maize subsidies has been captured predominantly by the medium-scale farm sector. These subsidies are likely enabling some consolidation in the smallholder sector and act as incentives for wage earner investment in agriculture. Interestingly, while these subsidies have coincided with a large increase in aggregate maize production, there has not been a significant decline in maize meal prices (Sitko and Kuteya 2013).

This process of medium-scale farm growth is leading to an under-utilization of agricultural land and is stifling agricultural output per hectare, as many medium-scale land owners are utilizing a small portion of their available land for food production purposes, and achieving agricultural returns per hectares of land owned and cultivated that is a fraction of those attained by small-scale farmers. This raises additional concerns about the near-term implications of this land rush on aggregate food production and food prices.

Yet, the medium to long-term consequences of this land rush are more worrying still. Given the limited pace of wage labor market expansion, ensuring viable opportunities for small-scale farmers in the medium-term is essential if Zambia, and other African nations, are to cope with the large and growing number of young people entering the labor force each year (Losch 2008). Through the alienation of land in high potential areas and the exacerbation of land inequality conditions, this domestic land rush is foreclosing the potential for future generations of small-scale farmer to acquire viable parcels of land, to link to a virtuous cycle

of input intensification and output market engagement, and ultimately, to contribute to a smallholder-led economic transformation.

The ways in which medium-scale land owners are reshaping the agricultural landscape suggest that even in low density countries such as Zambia the capacity to utilize the agricultural sector and agricultural spending to achieve broad-based growth and poverty reduction objectives are fundamentally tied up with land policy. As African food production comes to play an increasingly important role in the future of the global food system, it is critical that domestic policy-makers and international donors recognize the important intersections between land policy, land distribution, and agricultural development outcomes. In order to meaningfully affect the enduring problems of rural poverty and hunger requires a more explicit recognition of how land policies are shaping the current and future prospects of Africa's rural poor.

What can be done from a policy perspective to retain viable land access opportunities for existing small-scale farmers without stifling potentially valuable domestic investment in agriculture? An important place to begin is to provide a clear framework for protecting the land rights of current small-scale farmers, particularly in regions witnessing significant domestic investor interest in land. This may entail land mapping exercises with traditional authorities, which can demarcate small-scale farming areas and areas where external investments can occur. This must be coupled with a change in land taxation systems for titled land. Land taxes in Zambia are currently negligible for land title holders. This allows individuals with no immediate interest in utilizing land to acquire it and sit on it for years. Increasing land taxes will increase incentives to invest in land and will limit speculative acquisitions. More fundamentally, Zambia needs to implement an overarching land policy that seeks to balance the social and economic objectives of the country. Until a land policy is in place, pressure from domestic investors to acquire valuable farm land will continue unabated, to the detriment of future generations of small-scale farmers.

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